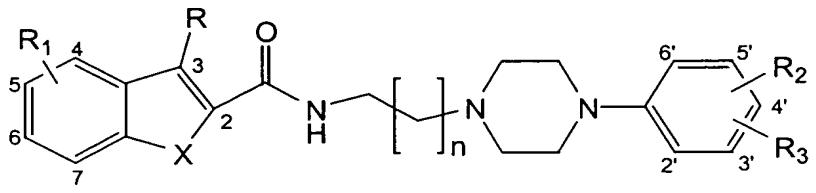
Claims

1. A compound of the general formula (I)



(I)

wherein:

- n = 1 - 4 and
- R = hydrogen, alkyl or halogen and

(a) X = S or O:

(i) when R_1 is hydroxy, alkyloxy, alkenyl, alkinyl, aryl, acyl, alkoxycarbonyl or cyano, each of R_2 and R_3 are independently selected from hydrogen, hydroxy, alkyloxy, alkyl, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl and cyano,

(ii) when R_1 is hydrogen, alkyl, halogen or trifluoromethyl, R_2 is selected from hydroxy, alkenyl, alkinyl, aryl, acyl, alkoxycarbonyl and cyano and R_3 is selected from hydrogen, hydroxy, alkyloxy, alkyl, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl and cyano,

or

(b) X = NH:

R_1 is selected from hydrogen, hydroxy, alkyl, alkyloxy, alkenyl, alkinyl, aryl, trifluoromethyl, acyl, alkoxycarbonyl, halogen and cyano and each of R_2 and R_3 are selected independently from hydrogen, hydroxy, alkyloxy, alkyl, alkenyl, alkinyl, aryl,

halogen, trifluoromethyl, acyl, alkoxycarbonyl and cyano, with the proviso that the compound is not N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-2-indolylcarbamide,

or

(c) X = Te:

R_1 is selected from hydrogen, hydroxy, alkyl, alkyloxy, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl and cyano and each of R_2 and R_3 are selected independently from hydrogen, hydroxy, alkyloxy, alkyl, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl and cyano.

wherein the groups alkyl, alkenyl, alkinyl and aryl may optionally be substituted independently of one another,

and pharmaceutically acceptable salts of this compound.

2. A compound according to claim 1 wherein

- n = 1 - 4

and

- X = Te, when R = hydrogen, alkyl or halogen and R_1 is substituted by the radicals hydrogen, hydroxy, alkyl, alkyloxy, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl or cyano and R_2 and R_3 are substituted individually or jointly by the radicals hydrogen, hydroxy, alkyloxy, alkyl, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl or cyano,

or

- X = S or O, when R = hydrogen, alkyl or halogen and R_1 is substituted by the radicals hydroxy, alkyloxy, alkenyl, alkinyl, aryl, acyl, alkoxycarbonyl or cyano and R_2 and R_3 are substituted individually or jointly by the radicals hydrogen, hydroxy, alkyloxy, alkyl, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl or cyano,

or

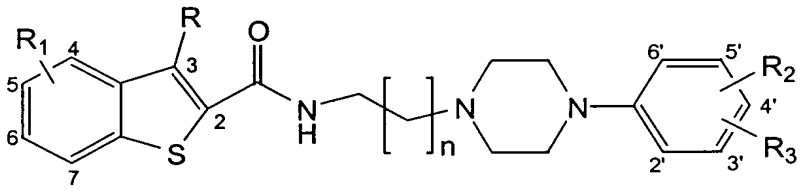
- X = S or O, when R = hydrogen, alkyl or halogen and R_1 is substituted by the radicals hydrogen, alkyl, halogen or trifluoromethyl and R_2 and

R_3 are substituted individually or jointly by the radicals hydroxy, alkenyl, alkinyl, aryl, acyl, alkoxycarbonyl or cyano,

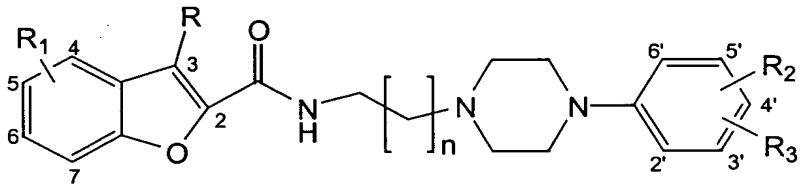
or

- X = NH, when R = hydrogen, alkyl or halogen and R_1 is substituted by the radicals hydroxy, alkyl, alkyloxy, alkenyl, alkinyl, aryl, trifluoromethyl, acyl, alkoxycarbonyl or cyano, it being required that alkyl and alkyloxy contain at least two carbon atoms, and R_2 and R_3 are substituted individually or jointly by the radicals hydrogen, hydroxy, alkyloxy, alkyl, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl or cyano and alkyloxy comprises at least two carbon atoms.

3. A compound according to claim 1 having the general formula (Ia) or (Ib):



(Ia)



(Ib)

wherein:

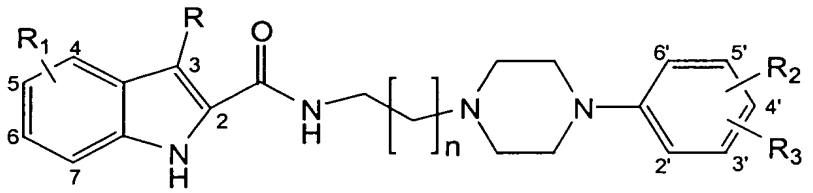
- n = 1 - 4,
- R = hydrogen, C_1-C_6-alkyl or halogen,
- when R_1 is hydroxy, C_1-C_6-alkyloxy, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, C_1-C_6-acyl, C_1-C_6-alkoxy carbonyl or cyano, each of R_2 and R_3 are independently selected from hydrogen, hydroxy, C_1-C_6-alkyloxy, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, halogen, trifluoromethyl, C_1-C_6-acyl, C_1-C_6-alkoxycarbonyl and cyano,

- when R_1 is hydrogen, C_1-C_6-alkyl, halogen or trifluoromethyl, R_2 is selected from hydroxy, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, C_1-C_6-acyl, C_1-C_6-alkoxycarbonyl and cyano, and R_3 is selected from hydrogen, hydroxy, C_1-C_6-alkyl, C_1-C_6-alkyloxy, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, halogen, trifluoromethyl, C_1-C_6-acyl, C_1-C_6 alkoxycarbonyl and cyano,

  wherein the groups C_1-C_6-alkyl, C_2-C_6-alkenyl and C_2-C_6-alkinyl may optionally also be substituted independently of one another,

and pharmaceutically acceptable salts thereof.

4. A compound according to claim 1 of the general formula (Ic):



(Ic)

wherein:

- n = 1 - 4,
- R = hydrogen, C_1-C_6-alkyl or halogen,
- R_1 is selected from hydrogen, hydroxy, C_1-C_6-alkyl, C_1-C_6-alkoxy, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, trifluoromethyl, C_1-C_6-acyl, C_1-C_6-alkoxycarbonyl, fluorine, chlorine, bromine and cyano,
- each of R_2 and R_3 are independently selected from hydrogen, hydroxy, C_1-C_6-alkyl, C_1-C_6-alkyloxy, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, halogen, trifluoromethyl, C_1-C_6-acyl, C_1-C_6-alkoxycarbonyl and cyano,

wherein the groups C_1-C_6 alkyl, C_2-C_6 alkenyl and C_2-C_6 alkinyl may optionally also be substituted independently of one another,

and pharmaceutically acceptable salts of this compound, with the proviso that the compound is not N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-2-indolylcarbamide.

5. A compound according to claim 4, wherein

(a) when R_1 is hydroxy, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, trifluoromethyl, C_1-C_6-acyl, C_1-C_6-alkoxycarbonyl or cyano, each of R_2 and R_3 are independently selected from hydrogen, hydroxy, C_1-C_6-alkyl, C_1-C_6-alkyloxy, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, halogen, trifluoromethyl, C_1-C_6-acyl, C_1-C_6-alkoxycarbonyl and cyano,

and

(b) when R_1 is hydrogen, C_1-C_6-alkyl, C_1-C_6-alkyloxy or halogen, R_2 is selected from hydroxy, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, C_1-C_6-acyl, C_1-C_6-alkoxycarbonyl and cyano, and R_3 is selected from hydrogen, hydroxy, C_1-C_6-alkyl, C_1-C_6-alkyloxy, C_2-C_6-alkenyl, C_2-C_6-alkinyl, phenyl that may optionally be substituted with a methoxy group or halogen, halogen, trifluoromethyl, C_1-C_6-acyl, C_1-C_6-alkoxycarbonyl and cyano,

wherein the groups C_1-C_6 alkyl, C_2-C_6 alkenyl and C_2-C_6 alkinyl may optionally also be substituted independently of one another,

and pharmaceutically acceptable salts of this compound.

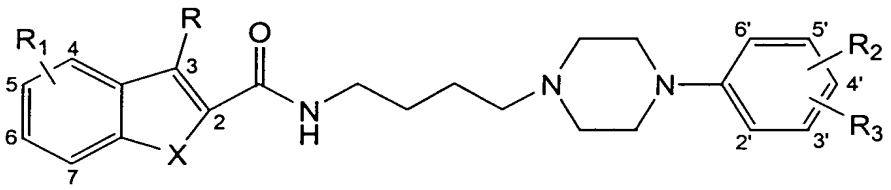
6. A compound according to any of the previous claims wherein

- the substituent R_1 is in position 5 or 6 of the heterocycle, and

- the substituents R_2 and R_3 are in the positions 2 or 3, respectively, or in the positions 2 or 4, respectively, of the phenyl ring; the respective other substituent being in position 2 of the phenyl ring in the event that one of the two substituents R_2 and R_3 is a hydrogen atom.

7. A compound according to any of the previous claims wherein n = 3.

8. A compound of the general formula (IV):



(IV)

wherein:

- X = S, NH or O,
- R is selected from hydrogen, C_1-C_6-alkyl, fluorine, chlorine and bromine,
- R_1 is selected from hydrogen, C_1-C_6-alkoxy, C_1-C_6-alkyl, fluorine, chlorine, bromine, trifluoromethyl and cyano, R_1 being in position 5 or 6 of the heterocycle,
- R_2 and R_3 are independently selected from hydrogen, C_1-C_6-alkyloxy, C_1-C_6-alkyl, fluorine, chlorine, bromine and trifluoromethyl, R_2 and R_3 being in the positions 2 or 3, respectively, or in the positions 2 or 4, respectively, of the phenyl ring, and the respective other substituent being in position 2 of the phenyl ring in the event that one of the two substituents R_2 and R_3 is a hydrogen atom

wherein the C_1-C_6 alkyl groups are optionally substituted independently of one another

and pharmaceutically acceptable salts of this compound with the proviso that the compound is not N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-2-indolylcarbamide.

9. A compound according to claim 8, wherein

- when X = NH, then R_1 is selected from hydrogen, C_1-C_3-alkyloxy, C_1-C_3-alkyl, fluorine, chlorine, bromine and cyano,
  and
- when X = S or O, then R_1 is selected from hydrogen, C_1-C_3-alkyl, fluorine, chlorine, bromine, cyano and trifluoromethyl.

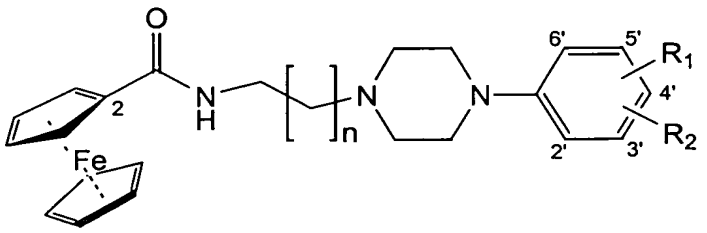
10. A compound according to any of the previous claims selected from

N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-5-cyano-2-benzo[b]thiophenylcarbamide,
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-5-cyano-2-benzo[b]thiophenylcarbamide,
N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-6-cyano-2-benzo[b]thiophenylcarbamide,
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-6-cyano-2-benzo[b]thiophenylcarbamide,
N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-2-benzo[b]thiophenylcarbamide,
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-2-benzo[b]thiophenylcarbamide,
N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-5-bromo-2-benzo[b]thiophenylcarbamide,
N-4-(4-(2,3-dichlorhenyl)piperazine-1-yl)butyl-5-bromo-2-benzo[b]thiophenylcarbamide,
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-2-indolylcarbamide,
N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-5-cyano-2-indolylcarbamide,
N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-5-bromo-2-indolylcarbamide,

N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-6-cyano-2-indolylcarbamide,
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-5-bromo-2-indolylcarbamide,
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-6-cyano-2-indolylcarbamide,
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-5-cyano-2-indolylcarbamide,
N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-5-cyano-2-benzo[b]furanylcarbamide,
N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-2-benzo[b]furanylcarbamide,
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-2-benzo[b]furanylcarbamide,
N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-5-bromo-benzo[b]furanylcarbamide,
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-5-bromo-2-benzo[b]furanylcarbamide,
N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-2-benzo[b]tellurophenylcarbamide und
N-4-(4-(2,3-dichlorophenyl)piperazine-1-yl)butyl-2-benzo[b]tellurophenylcarbamide

and pharmaceutically acceptable salts thereof.

11. A compound of the general formula (II)



(II)

wherein
n = 1 - 4 and R_1 and R_2 individually or jointly represent the radicals hydrogen, hydroxy, alkyloxy, alkyl, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl or cyano.

12. A compound according to claim 11 wherein each of R_1 and R_2 is independently selected from hydrogen, hydroxy, C_1-C_6 alkyloxy, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkinyl, aryl, fluorine, chlorine, bromine, trifluoromethyl, C_1-C_6 acyl, C_1-C_6 alkoxycarbonyl and cyano wherein the groups C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkinyl and aryl may optionally also be substituted independently of one another.

13. A compound according to claim 12 selected from

N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-2-ferrocenylcarbamide
and
N-4-(4-(2,3-Dichlorophenyl)piperazine-1-yl)butyl-2-ferrocenylcarbamide.

14. A therapeutic agent containing one or more of the compounds according to any of the previous claims.

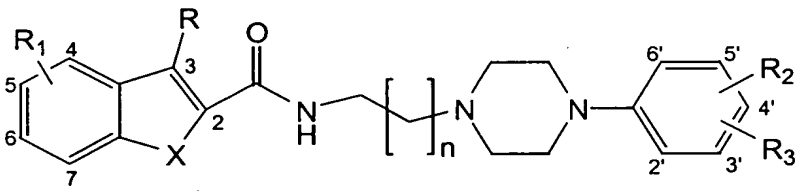
15. A therapeutic agent according to claim 14 which additionally contains L-DOPA for simultaneous or sequential administration to the patient.

16. The use of a compound according to any of the claims 1 to 13 for preparing a therapeutic agent for the therapy or prevention of cocaine, alcohol, opiate and nicotine addiction; neurodegenerative disorders, especially Parkinson's disease; sexual dysfunction; depression or schizophrenia.

17. The use of a compound according to any of the claims 1 to 13 for preparing a therapeutic agent for the therapy or prevention of hyperprolactinaemia; hyperprolactinoma; glaucoma; cognitive disorders; restless leg syndrome; hyperactivity syndrome (ADHS); locomotion disorders associated with Parkinson's disease; L-DOPA-induced disorders, Segawa syndrome; tardive locomotion disorders as well as for medication-assisted ablactation after pregnancies.

18. The use according to claim 17, the therapeutic agent being provided for the therapy or prevention of Segawa syndrome; spontaneous dyskinesia or dystonia associated with Parkinson's disease or tardive or L-DOPA induced dyskinesia or dystonia.

19. The use of a compound of the general formula (III):



(III)

wherein:
n = 1 - 4 and X = S, O or NH, when R = hydrogen, alkyl or halogen and R_1 is substituted by the radicals hydrogen, alkyl, halogen, trifluoromethyl and each of R_2 and R_3 are substituted individually or jointly by the radicals hydrogen, hydroxy, alkyloxy, alkyl, alkenyl, alkinyl, aryl, halogen, trifluoromethyl, acyl, alkoxycarbonyl or cyano, for preparing a pharmaceutical agent for the therapy or prevention of cocaine, alcohol, opiate and nicotine addiction; neurodegenerative disorders, especially Parkinson's disease; or sexual dysfunction.

20. The use of a compound according to claim 19 for preparing a therapeutic agent for the therapy or prevention of depression or schizophrenia.

21. The use of a compound according to claim 19 for preparing a therapeutic agent for the therapy or prevention of hyperprolactinaemia; hyperprolactinoma; glaucoma; cognitive disorders; restless leg syndrome; hyperactivity syndrome (ADHS); locomotion disorders associated with Parkinson's disease; L-DOPA-induced disorders, Segawa syndrome; tardive locomotion disorders as well as for medication-assisted ablactation after pregnancies.

22. The use according to claim 21, the therapeutic agent being used for the therapy or prevention of Segawa syndrome, spontaneous dyskinesia or dystonia associated with Parkinson's disease or tardive or L-DOPA induced dyskinesia or dystonia.

23. The use according to any of the claims 19 to 22
wherein

- R is selected from hydrogen, C_1-C_6 alkyl, fluorine, chlorine and bromine,

- R_1 is selected from hydrogen, C_1-C_6 alkoxy, C_1-C_6 alkyl, fluorine, chlorine, bromine and trifluoromethyl, and

- each of R_2 and R_3 is independently selected from hydrogen, C_1-C_6 alkoxy, C_1-C_6 alkyl, fluorine, chlorine, bromine and trifluoromethyl

wherein the groups C_1-C_6 alkyl may optionally also be substituted.

24. The use according to any of the claims 19 to 23, wherein

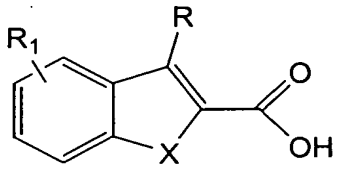
- the substituent R_1 is in position 5 or 6 of the heterocycle, and

- the substituents R_2 and R_3 are in the positions 2 or 3, respectively, or in the positions 2 or 4, respectively, of the phenyl ring; the respective other substituent being in position 2

of the phenyl ring in the event that one of the two substituents R_2 and R_3 is a hydrogen atom.

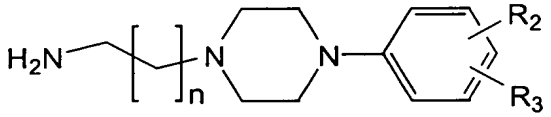
25. The use according to any of the claims 19 to 24 wherein the compound is N-4-(4-(2-methoxyphenyl)piperazine-1-yl)butyl-2-indolylcarbamide.

26. A method for preparing a compound of the general formulae (I), (III), or (IV) as defined above comprising reacting a compound of the general formula (A) in activated form, especially in the form of the carboxylic acid halide



(A)

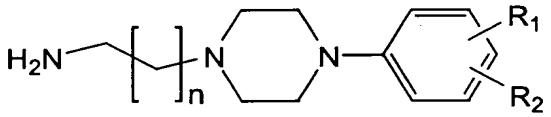
with a compound of the general formula (B):



(B)

wherein n, R, R_1, R_2 and R_3 are as defined for the general formulae (I), (III) and (IV).

27. A method for preparing a compound of the general formula (II) as defined above comprising reacting ferrocene-2-carboxylic acid in activated form with a compound of the general formula (B')



(B')

wherein n, R_1 and R_2 are as defined in formula (II).